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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/760,118	01/16/2004	Daniel A. Tichenor	SAND-01120US0	7391

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EXAMINER	
AMARI, ALESSANDRO V	

ART UNIT	PAPER NUMBER
2872	

DATE MAILED: 11/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/760,118	TICHENOR ET AL.	
	Examiner	Art Unit	
	Alessandro V. Amari	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 September 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-37* is/are pending in the application.

4a) Of the above claim(s) *24-37* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1/16/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group I, species 1 in the reply filed on 21 September 2005 is acknowledged. After examining the claimed subject matter, the Examiner has concluded that the election of species requirement was incorrect and so claims 1-23 will be examined in this office action. However, the Examiner maintains that the method claims (claims 24-37) are patentably distinct from the apparatus claims (claims 1-23). Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement in regard to the apparatus and method claims, the election has been treated as an election without traverse (MPEP § 818.03(a)). Thus, claims 24-37 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-7, 10-20 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sweatt et al US 6,469,827 in view of Shiraishi US 6,833,223.

In regard to claims 1 and 15, Sweatt teaches (see Figure 1A) a condenser system having a set of mirrors (30) for collecting extreme ultra-violet radiation from a radiation source as described in column 3, lines 49-54, that forms a source image and having correcting mirrors (40, 50) which are capable of translating or rotating or both, one or more beams from said set of mirrors and are capable of modifying the convergence of the one or more beams or the size of the source image, or both. Regarding claims 3, 4, 11 and 17, Sweatt et al teaches that the radiation source is a laser plasma source as described in column 3, lines 49-54 and column 4, lines 61-65. Regarding claim 12, Sweatt teaches that the system is for use with a ringfield camera wherein that at least one collector mirror comprises at least two substantially equal radial segments of a parent aspheric mirror, each having one focus at the radiation source and a curved line focus filling the object filed of the camera at the radius of the ringfield and each producing a beam of radiation as described in column 2, lines 20-26. Regarding claim 13, Sweatt teaches (see Figure 1A) a corresponding number of sets of correcting mirrors which are capable of translation or rotation, or both such that all of the beams of radiation pas through the entrance pupil of the camera and form a coincident arc image at the ringfield radius, wherein at least one of the correcting mirrors of the set, or a mirror that is common to both sets from which the radiation emanates is a concave relay mirror that is positioned to shape a beam segment having a chord angle of about 25 to 85 degrees into a second beam segment having a chord angle of about 0 to 60

degrees wherein the distance from the collector mirrors to the concave relay mirror is equal to 3 to 10 times the distance from the concave relay mirror to the mask as described in column 2, lines 15-38 and as shown in Figure 1A. Regarding claim 14, Sweatt teaches that the collector mirror comprises six substantially equal radial segments of a parent aspheric mirror as described in column 3, lines 3-5.

However, in regard to claims 1 and 15, Sweatt does not teach that the system includes at least one collector mirror facing a source of EUV radiation wherein the at least one collector mirror comprises a substrate, an underlying reflective surface and an upper sacrificial reflective surface.

In regard to claims 1 and 15, Shiraishi teaches (see Figures 1A, 4A) at least one collector mirror facing a source of EUV radiation wherein the at least one collector mirror comprises a substrate (55), an underlying reflective surface (56, 57; 86, 87) and an upper sacrificial reflective surface (56, 57; 86, 87) as described in column 9, lines 52-67 and column 10, lines 1-56. Although the prior art does not specifically teach the claimed sacrificial surface, this feature is seen to be an inherent teaching of that device since it is apparent that the topmost layers of mirror being exposed to the corrosive environment in the chamber would be eroded or sacrificed.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the collector mirror of Shiraishi in the condenser system of Sweatt et al in order to provide for a multilayer film mirror that exhibits high reflectivity to incident radiation independently of the angle of incidence.

Regarding claims 2 and 16, Shiraishi teaches that the collector mirror does not include a passivating overcoat as shown in Figures 1A and 4A.

Regarding claims 5 and 18, Shiraishi teaches that the underlying reflective surface has a normal incidence reflectivity of at least about 30% of the EUV radiation as shown in Figure 8.

Regarding claims 6 and 19, Shiraishi teaches that the underlying reflective surface comprises a first multilayer film that is deposited on a surface of the substrate and wherein the sacrificial reflective surface is a second multilayer film that is deposited on a surface of the underlying reflective surface as shown in Figure 1A and 4A.

Regarding claims 7 and 20, Shiraishi teaches that the first multilayer film comprises alternating layers of first material having a first refractive index and a second material having a second refractive index that is larger than that of the first material and the second multilayer film comprises alternating layers of third material having a third refractive index and a fourth material having a fourth refractive index that is larger than the third material as described in column 4, lines 21-26, column 9, lines 52-67 and column 10, lines 1-56.

Regarding claims 10 and 23, Shiraishi teaches that the first multilayer film comprises alternating layers of molybdenum and silicon and the second multilayer film comprises alternating layers of molybdenum and silicon as described in column 9, lines 52-67 and column 10, lines 1-56.

4. Claims 8, 9, 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sweatt et al US 6,469,827 in view of Shiraishi US 6,833,223.

Regarding claims 8, 9, 21 and 22, Sweatt et al in view of Shiraishi teaches the claimed invention and regarding claims 9 and 22, Shiraishi teaches that the first multilayer film has a periodicity of about 5nm to 30 nm and the second multilayer film has a periodicity of about 5nm to 30nm as described in column 9, lines 55-58. However, regarding claims 8 and 21, Sweatt et al in view of Shiraishi does not teach that the first multilayer film comprises about 20 to 80 pairs and the second multilayer film comprises about 100 to 400 layer pairs. It would have been obvious to one having ordinary skill in the art at the time the invention was made to vary the number of layer pairs of the multilayer film, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. One would have been motivated to adjust the number of layers of the multilayer film for the purpose of optimizing reflectivity of the incident radiation. *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alessandro V. Amari whose telephone number is (571) 272-2306. The examiner can normally be reached on Monday-Friday 8:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on (571) 272-2312. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ava
26 October 2005

Alessandro Amari
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Examiner AU 2872